



U 21303A

**United States Patent** [19]

Terada et al.

[11] **Patent Number:** 6,021,303[45] **Date of Patent:** Feb. 1, 2000[54] **IMAGE HEATING DEVICE AND IMAGE FORMING DEVICE USING THE SAME**

[75] **Inventors:** Hiroshi Terada, Ikoma; Akinori Toyoda; Yoshihito Urata, both of Katano; Hajime Yamamoto, Ikoma; Nobuo Genji, Osakasayama; Naoaki Ishimaru, Minoo; Tatsuo Nakatsugawa, Utsunomiya; Masakazu Naito, Shioya-gun, all of Japan

[73] **Assignee:** Matsushita Electric Industrial Co., Ltd., Osaka, Japan

[21] **Appl. No.:** 09/309,922[22] **Filed:** May 11, 1999[30] **Foreign Application Priority Data**

May 15, 1998	[JP]	Japan	10-132984
Jul. 17, 1998	[JP]	Japan	10-203005

[51] **Int. Cl.<sup>7</sup>** ..... G03G 15/20[52] **U.S. Cl.** ..... 399/328; 399/329; 399/330; 399/335[58] **Field of Search** ..... 399/320, 328, 399/329, 330, 333, 335, 338[56] **References Cited****U.S. PATENT DOCUMENTS**

4,256,945	3/1981	Carter et al. .
5,568,240	10/1996	Ohtsuka .

5,713,069	1/1998	Kato	399/330
5,752,148	5/1998	Yoneda et al.	399/329
5,765,086	6/1998	Kishino et al.	399/329
5,768,673	6/1998	Morigami	399/330
5,778,293	7/1998	Ohtsuka .	
5,822,669	10/1998	Okabayashi et al.	399/330
5,862,445	1/1999	Ogawa et al.	399/329
5,881,349	3/1999	Nanataki et al.	399/328
5,939,337	8/1999	Hatakeyama et al.	399/335 X
5,940,655	8/1999	Sano et al.	399/328 X

*Primary Examiner*—Sandra Brase*Attorney, Agent, or Firm*—Merchant & Gould, P.C.[57] **ABSTRACT**

An image heating device comprises a cylindrical heating roller with a Curie temperature of 210° C., a magnetization coil for magnetizing the heating roller with an alternating magnetic field, which is arranged inside the heating roller, and a nip portion for heating a recording material that carries a toner image with heat from the heating roller, while the recording material is being conveyed along said nip portion. The ratio between the amount of heat generated in said heat-generating member at Curie temperature or higher to the amount of heat generated at room temperature in said heat-generating member is not more than ½. With this configuration, the heating roller can regulate its own temperature to stabilize at a temperature that is suitable for fixing, and the problems of partial overheating or underheating, unstable heat generation, or damage of the device can be eliminated.

**34 Claims, 10 Drawing Sheets**